

clarion Service Manual

Published by Service Information Section



CITROEN Automobile Genuine LW/MW/FM-MPX Synthesizer Radio Cassette Combination Model **PU-9594A-D** (Genuine No. PC302C)

SPECIFICATIONS:

Radio section

Circuit system: Superneterodyne
Tuning system: Electronic tuning
Receive range: LW 153kHz to 281kHz
MW 531kHz to 1,602kHz
UKW(FM) 87.5MHz to 108.0MHz

Intermediate frequency:

LW 450kHz
MW 450kHz
UKW(FM) 10.7MHz

Quieting sensitivity: LW Less than 39dB
(at 20dB S/N)

MW Less than 32dB
(at 20dB S/N)

UKW(FM) Less than 12dB
(at 30dB S/N)

Separation: UKW(FM) More than 20dB

Auto tuning stop sensitivity:

LW DX 30±10dB
LO 50±10dB

MW DX 30±10dB
LO 50±10dB

UKW(FM) DX 25±10dB
LO 45±10dB

Tape speed: 4 76cm/sec. (1-7/8 ips)
Wow and flutter: Less than 0.18% (W.R.M.S)
S/N ratio: NORM (120μs)
More than 48dB (DD OFF)
More than 56dB (DD ON)
MTL (70μs)
More than 50dB (DD OFF)
More than 58dB (DD ON)
Cross talk: More than 40dB
Separation: More than 30dB
FF/REW time: Less than 130sec (C-60)

Synthesis

Power supply voltage: DC 13.2V (10.8V to 15.6V)
Negative ground

Current consumption:

Less than 10A

Load impedance: 4Ω×2, 4Ω×4

Power output: More than 12W×2
(at max. output)

Dimensions: Width 178mm

Height 50mm

Depth 130mm

Weight: 1.7kg

• Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"DOLBY" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation

Tape section

Reproduction system:

4 track, 2 channel stereo
cassette tape playback

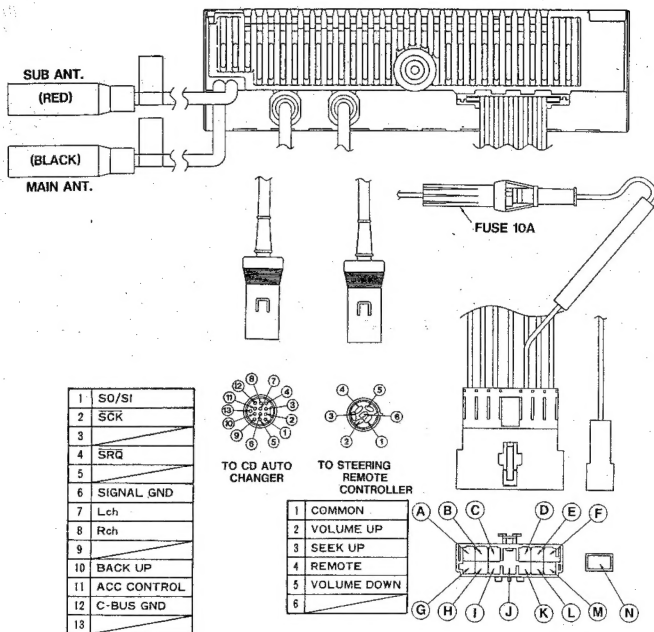
COMPONENTS:

PU-9594A-D

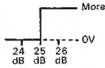
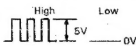
Main unit	1
Mounting bracket	300-9393-01 1

PU-9594A-D

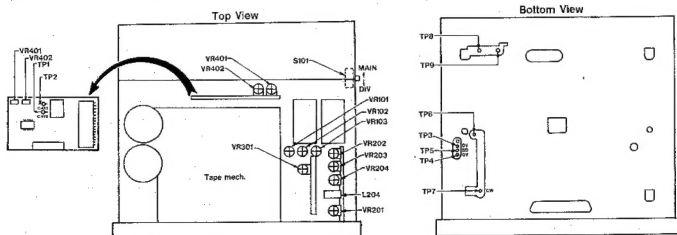
■ REAR VIEW AND CONNECTORS:



ADJUSTMENT:

Adjustment item	Adjustment point	Procedure	Diversity SW S101
Dolby NR	VR401 and VR402	Insert a Dolby level test tape (400Hz-200nWb/m), connect the mill-volt meter to TP1 and TP2, and adjust VR401 and VR402 to obtain an output of 388mV \pm 1dB.	MAIN
OV	L204	1. Connect the digital voltmeter to TP3 and TP4. 2. Input the 98.1MHz/55dB signal and adjust the reading of digital voltmeter to 0V \pm 30mV by L204.	MAIN
Limiter	VR202	1. Input the 98.1MHz, 55dB SSG signal. (400Hz, 30%) 2. Adjust Main VR to make the set output 0dB (0.775V). 3. Reduce the output of SG 10dB. 4. Adjust VR202 untill output level decrease to 3dB.	MAIN
SD	VR204	1. Input the 98.1MHz/25dB signal (400Hz, 30%). 2. Adjust VR204 so that the voltage of TP5 is in the range 0V to 3.5V. 	MAIN
S-meter	VR103	1. Connect the digital voltmeter to TP6. 2. Input the 98.1MHz frequency at 30dB (no mod.) and adjust the level to 2.4V \pm 0.1V by VR103.	MAIN
SASC	VR203	1. Input the 98.1MHz/65dB, 7kHz modulation frequency, 30% modulation degree SSG signal. 2. Adjust the output level of the volume controller to 0dBm (0.775V). 3. Set the SSG output to 33dB and adjust VR203 so that the output level is -2dB.	MAIN
Separation	VR201	1. Input the 98.1MHz, connect the output of a stereo modulator to the external modulation terminal, and input a 65dB (1kHz, 100%) SSG signal. 2. Set the stereo modulator to the L or R ch and adjust VR201 so that the maximum separation is obtained. (More than 20dB)	MAIN
CW (Carrier Wave)	VR301	1. Input the 98.1MHz/55dB, 400Hz modulation frequency, 7.0kHz modulation rate SSG signal. 2. Connect the oscilloscope to TP7. 3. Adjust VR301 so that the waveform of TP7 is in the range 5V to 0V. (6.8kHz-Low, 7.2kHz-High) 	MAIN
Diversity Main fix	VR102	1. Connect the digital voltmeter to TP8 and GND. 2. Input the 98.1MHz frequency at 20dB (400Hz, 30%) and adjust the level to 1.0V \pm 0.1V by VR102.	DIV
Diversity Sensitivity	VR101	1. Connect the digital voltmeter to TP9 and GND. 2. Input the 98.1MHz frequency at 15dB (7kHz, 100%) and adjust the level to 20mV \pm 3mV by VR101.	DIV

ADJUSTMENT POINT



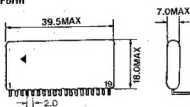
■ EXPLANATION OF IC's:

■ IC's other than explained below are described in Service Manual
 'EXPLANATION OF IC's' Vol.2~Vol.4.

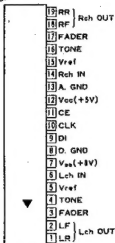
■ THA5001B 051-1516-32 Electronic Volume Control
 EV2000-2 051-1516-22

051-1516-22 and 051-1516-32 have mutual changeability.

Outward Form



Terminal Connection



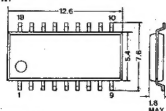
Electrical Characteristics

(Ta=25°C, V_{DD}=8V, V_{CC}=5V, unless otherwise specified, Volume · Tone · Fader, 0dB)

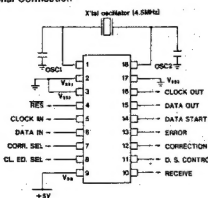
Item	Symbol	Condition	Min.	Typ.	Max.	Unit		
Tone effect	BASS boost	TB1	f=100Hz	Bass: +14dB	+8	+10	+12	dB
	BASS cut	TB2	f=100Hz	Bass: -14dB	-12	-10	-8	dB
	TREBLE boost	TT1	f=10kHz	Treble: +14dB	+8	+10	+12	dB
	TREBLE cut	TT2	f=10kHz	Treble: -14dB	-12	-10	-8	dB
Loudness effect	LD1	f=100Hz	Volume: -20dB	+6	+8	+10	dB	
	LD2	f=10kHz	Loudness: OFF→ON	+5	+7	+9	dB	
Volume minimum	Vmin	Volume: -79dB	-76	-70	-70	dB		
Fader minimum	Fmin	Fader: -∞dB	-80	-70	-70	dB		

■ LC7073M 051-1150-20 Sync/Error correction LSI for RDS

1. Outward Form



II. Terminal Connection



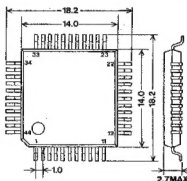
III. Terminal Connection Table

Pin No.	Symbol	Function
1	OSC 1	Connection terminal for crystal oscillator.
18	OSC 2	Allows connection of 4.5MHz crystal
2	V _{DD}	Ground.
3	V _{DD}	
17	V _{DD}	
4	RES	Reset terminal.
5	CLOCK IN	RDS recovery clock input.
6	DATA IN	RDS recovery data input.
7	CORR SEL	Correction or non correction input for input signal.
8	CL. ED. SEL	Serial output clock polarity setting input.
9	V _{DD}	Power supply terminal (5V).
10	RECEIVE	After finishing a synchronous detection, while serial output is made, L level output is applied. In other cases, H level output.
11	D. S. CONTROL	Data start signal control input.
12	CORRECTION	Correction output terminal.
13	ERROR	Error output terminal.
14	DATA START	Block data start signal output.
15	DATA OUT	Data output for serial output.
16	CLOCK OUT	Clock output for serial output.

■ TAB172AF 051-1525-00 FM PROCESSOR

This IC is a FM tuner IC, which is integrated from IF to MPX stages into one chip.

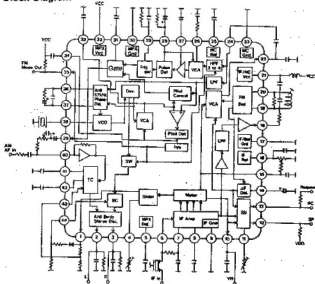
Outward Form



Function

IF.....IF limiter amplification/differential peak FM detection/signal meter/
 electric field strength muting/detuning muting/station detection/IF
 counting/regress.
 NC.....Noise detection/noise AGC/noise pass filter/noise pass filter wave
 changeover/signal delay/unadjusted pilot cancellation/signal holding
 MPX.....Unadjusted PLL method stereo decoder/blender control/tone control
 (low-cut, high-cut, anti-ARI, anti-birdie).

Block Diagram

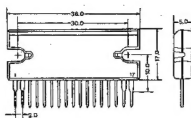


Terminal Connection

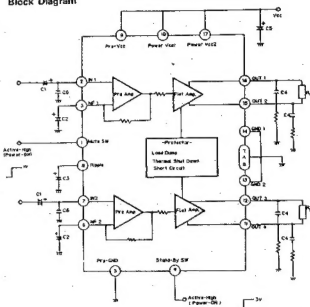
Pin No.	Symbol	Function
1	SD	Slider output terminal.
2	L out	MPX output terminal.
3	R out	
4	Slide	Blender of MPX unit, controllable range setting terminal for electric field strength of tone.
5	Ref. 3	3rd nominal voltage terminal.
6	IF in	IF amp. input terminal.
7	Bias	Provide bias to 8th pin via R.
8	By 1	IF amp. bypass terminal.
9	G 1	IF amp. ground terminal.
10	Meter	Meter output terminal in FM mode, and meter input terminal for slider circuit in AM mode.
11	SD	Sensitivity setting terminal of station detector.
12	SP	Pulse counting output terminal stopped by station detector.
13	IFC	IF counting output terminal.
14	ΔF	ΔF detector output smoothing terminal.
15	SM	Soft-mute characteristic setting terminal.
16	Ref 1	1st nominal voltage terminal.
17	G 4	Sub-straight ground terminal.
18	IF out	IF limiter amp. output terminal.
19	Det 1	Input terminal of differential peak detection.
20	Det 2	
21	B 1	Power terminals of IF and noise canceler units.
22	AF out	Audio signal output terminal.
23	G 2	Ground terminal.
24	NC in	Input terminal of noise canceler unit.
25	Ref 2	2nd nominal voltage terminal.
26	By 2	AGC amp. bypass terminal of noise canceler unit.
27	By 3	Noise amp. bypass terminal of noise canceler unit.
28	AGC	Noise AGC time-constant setting terminal of noise canceler unit.
29	PW	Trigger-pulse range setting terminal of noise canceler unit.
30	G 3	Ground terminal of MPX unit.
31	Gate	Composite signal holding gate terminal of noise canceler unit.
32	B 2	Power terminal of MPX unit.
33	P	Canceled signal output terminal for pilot cancellation.
34	PD3	Output terminal of pilot detection circuit.
35	Mode	Mode output terminal of stereo/mono selection.
36	PD1	Output terminal of phase detection circuit.
37	PD2	
38	VCO	VCO circuit oscillation terminal.
39	NC out	Noise canceler output terminal.
40	MPX in	MPX input terminal.
41	LC	Cut-off frequency setting terminal.
42	HC	Tone-control (low-cut, high-cut) control terminal.
43	TC	
44	BC	Blender control terminal.

TA8210AL 051-1111-20 19W BTL×2ch Power Amp.

Outward Form

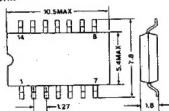


Block Diagram

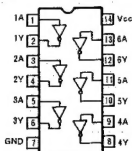


TC74HC04AF 051-0859-05 HEX INVERTER

Outward Form



Block Diagram

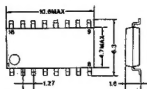


Truth Table

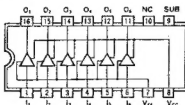
A	Y
L	H
H	L

■TD62706F(CLAR) 051-0942-05 High Voltage Source
Current Driver

Outward Form



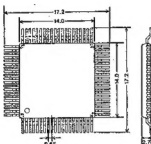
Block Diagram



■PD75328GC-605-389 051-1380-20 Slave Micro Computer

■051-1380-20 is a performance improved device of 051-1380-04.

Outward Form



Outline

- (1) The IC, as slave microcomputer, is to have function for data communication via serial bus interface with master microcomputer.
- (2) RDS decoder IC and synchronizing/correcting IC are controlled to input RDS data.

Terminal Connection

Pin No.	Terminal Name	I/O	Function
1-25		O	Unused (OPEN).
29	OK IND	I	ARI OK IND detection port. Active : LOW
30	SK IND	I	ARI SK IND detection port. Active : LOW
31	RDS IND	I	RDS IND detection port. Active : LOW
32	M6/M5	I	Detection port of M6/M5 selection. High=M6, Low=M5
33	GND	I	
34	R/CD	O	RADIO/CD audio changer port. High=RADIO, Low=CD Auto Changer
35	REMOTE	O	REMOTE Output port. Active : LOW
36	MUTE	O	MUTE Output port. Active : LOW
37	SRQ	O	Service Request Output port. Active : LOW
38	ACC DET	I	Detection port of ACC power ON/OFF (POWER DCP); master microcomputer controls ACC-CONT. High=ACC-ON, Low=ACC-OFF Active : High
39	SCK	O	Serial bus line SCK port.
40	SO	O	Serial bus line SO port.
41	SI	I	Serial bus line SI port.

Pin No.	Terminal Name	I/O	Function												
42	RDS CLK	I	RDS CLOCK input port. RDS data is input from LC7070.												
43		I	GND												
44		I													
45	PLL DO IN	I	PLL data input.												
46	RDS DATA	I	RDS DATA input port. RDS data is input from LC7070.												
47	RDS START	I	RDS DATA START bit input port. RDS data is input from LC7070.												
48	RDS ERROR	I	ERROR LOW : Incorrectable error occurred. HI : No error occurred or corrected.												
49	RDS CORR	I	CORRECTION <table><tr><td></td><td>CORR</td><td>ERROR</td></tr><tr><td>No error</td><td>H</td><td>H</td></tr><tr><td>Corrected</td><td>L</td><td>H</td></tr><tr><td>Incorrectable</td><td>L</td><td>L</td></tr></table>		CORR	ERROR	No error	H	H	Corrected	L	H	Incorrectable	L	L
	CORR	ERROR													
No error	H	H													
Corrected	L	H													
Incorrectable	L	L													
50		O	Unused (OPEN).												
51	PLL CLK	O	PLL clock output.												
52	PLL DI OUT	O	PLL data output.												
53	PLL CE	O	PLL chip enable port. Active : High												
54	LPF change-over	O	Low-pass filter changeover port.												
55	ST ON/OFF	O	Stereo/mono changeover port. Active : High												
56	ANT DUMP	O	HI : Antenna sensitivity decreased. Active : High												
57	AV _{DET} OUT	O	A/D nominal voltage output.												
58	FM S-METER	I	FM S-meter input. (Analog input)												
59		I													
60		I													
61		I	GND.												
62		I													
63		I													
64	A/D GND	I	A/D converter GND.												
65	A/D REF	I	Input of A/D converter nominal voltage.												
66	V _{cc}		Supply voltage of 5V.												
67	XT1	I	GND.												
68	XT2	—	Unused (OPEN).												
69	V _{ss}		Connect to V _{ss} .												
70	X1														
71	X2		System clock.												
72	RESET	I	RESET input. Active : Low												
73	RDS RESET	O	Function to reset LC7070. Active : Low												
74	IF REQ	O	IF REQUEST output port. Active : High												
75	IF MUTE	O	IF MUTE output. Active : High												
76	DX/L O	O	DX/LD changeover output port. Low : DX, High : Local												
77		I	GND.												
78	FM SD	I	FM SD input port. Active : High												
79	CW IN	I	CW (Carrier Wave) detection input port. Active : Low												
80	ST IN	I	ST detection input port. Active : Low												

REF.NO.	PART NO.	DESCRIPTION	QTY	REF.NO.	PART NO.	DESCRIPTION	QTY
IC201	051-1250-00	IC TC4588F	1	C129	176-6097-00	Ceramic chip capacitor 680pF CH	1
IC902	051-1272-00	IC μ PC2410HF	1	C210	176-6811-00	Ceramic chip capacitor 680pF CH	1
IC103	051-1282-00	IC TA7372P	1	C104,222	177-1042-05	Ceramic chip capacitor 0.1 μ F	2
IC403,404	051-1292-00	IC NJM4555M-D	2	C131	177-2242-05	Ceramic chip capacitor 0.22 μ F	1
IC901	051-1301-22	IC μ PD75008GB-582-384	1	C117,320,328	177-3332-05	Ceramic chip capacitor 0.033 μ F	3
IC102	051-1323-05	IC LC7218M	1	115,116,128 C206,207,212 227,228,235	177-4732-05	Ceramic chip capacitor 0.047 μ F	9
IC804	051-1375-35	IC	1				
IC104	051-1380-20	IC μ PD75328GC-605-388	1	C108,123,217	177-6832-05	Ceramic chip capacitor 0.068 μ F	3
IC402	051-1516-22	IC EV-2000-2	1	101,102,107 110,112,114 118,122,125 134,142 146~149			
IC202	051-1525-00	IC TA8172AF	1	C151,153,204 230,241,303 304,312,316 614,617,621 622,623,903 907,908	178-1032-05	Ceramic chip capacitor 0.01 μ F	32
IC608	051-1541-10	IC μ PD75516GF-436-388	1				
X601	060-0100-01	Buzzer	1				
X301	060-0115-02	Ceramic resonator 19KHz	1				
SUP101,102	060-0122-10	Surge protector	2	C144,145	178-1532-05	Ceramic chip capacitor 0.015 μ F	2
X102,602,901	060-0130-50	Ceramic resonator 4.19MHz	3	C232,322	178-2222-05	Ceramic chip capacitor 2200pF	2
X302	060-0146-50	Ceramic resonator 4.0MHz	1	C219,233,321	178-2232-05	Ceramic chip capacitor 0.022 μ F	3
BPFI02	060-0177-00	Band pass filter BPF-K5-M2T	1	C309,311	178-3322-05	Ceramic chip capacitor 3300pF	2
BPFI01	060-0235-00	Band pass filter HFE027	1	136,228,401 C402	178-4722-05	Ceramic chip capacitor 4700pF	4
DC101	060-0236-00	DC/DC converter	1	C208	178-4732-05	Ceramic chip capacitor 0.047 μ F	1
X201	060-0240-00	Ceramic resonator 19KHz	1	C319	178-6822-05	Ceramic chip capacitor 6800pF	1
L503	060-0282-00	EMI-filter DSS310-55	1	C231	042-0176-00	Electrolytic capacitor	1
X101	061-1066-00	Crystal 7.2MHz	1	C619	042-0200-00	Tantalum capacitor 10V47 μ F	1
Q113	100-1048-00	Transistor 2SA1048-O,Y,GR	1	C620	042-0450-00	Alum-electrolytic capacitor 3.3V470 μ F	1
Q816	100-1150-00	Transistor 2SA1150-O,Y	1	C513,516,615 618	179-2273-23	Electrolytic capacitor 10V220 μ F	4
115,401,610 612,613,614 Q817,618,901 902	100-1162-00	Transistor 2SA1162-O,Y,G	10	C517,518	179-2283-31	Electrolytic capacitor 16V2200 μ F	2
Q114	100-1297-00	Transistor 2SA1297-Y,GR	1	C203,209	179-4763-32	Electrolytic capacitor 16V470 μ F	2
Q605,608,903 905	100-1431-00	Transistor 2SA1431-O,Y	4	C625	179-4773-33	Electrolytic capacitor 16V470 μ F	1
Q203	102-2712-00	Transistor 2SC2712-O,Y,G,L	1	C238	182-1043-62	Electrolytic capacitor 50V0.1 μ F	1
101,104,105 Q106,108,109 201,601,611 904	102-2712-51	Transistor 2SC2712-G,L	10	215,236,237 C239,501,502 503,504	182-1053-82	Electrolytic capacitor 50V1 μ F	8
Q602,606	102-3420-00	Transistor 2SC3420-Y,GR,BL	2	C132,218	182-1053-63	Electrolytic capacitor 50V1 μ F	2
Q102,103	102-3624-00	Transistor 2SC3624A	2	C211,218,234 509~512	182-1063-32	Electrolytic capacitor 16V10 μ F	7
Q501~508	103-1306-00	Transistor 2SD1306-D,E	6	C201,205,420 421,422	182-1063-33	Electrolytic capacitor 16V10 μ F NP	5
Q903,609	103-1858-00	Transistor 2SD1858-P,Q,R	2	C417,418	182-1066-32	Electrolytic capacitor 16V10 μ F NP	2
Q202	106-0372-28	FET 2SK372-GR	1	C127,407,501 607,610	182-1073-22	Electrolytic capacitor 16V100 μ F	5
107,110,112 Q204,507,604 615,908	125-2004-03	Transistor RN1403	8	C906	182-1073-32	Electrolytic capacitor 16V100 μ F	1
Q807	125-2004-06	Transistor RN1406	1	C214	182-2253-63	Electrolytic capacitor 50V2.2 μ F	1
R657	032-0084-00	Fuse resistor 1/4W100	1	C624	182-2263-32	Electrolytic capacitor 16V22 μ F	1
C606,612	173-1031-10	Polyester capacitor 0.01 μ F	2	C111	182-3363-42	Electrolytic capacitor 25V33 μ F	1
C514,515	173-1041-10	Polyester capacitor 0.1 μ F	2	C130	182-4763-52	Electrolytic capacitor 35V4.7 μ F	1
C519~526	173-1241-10	Polyester capacitor 0.12 μ F	8	C609	182-4756-52	Electrolytic capacitor 35V4.7 μ F NP	1
105,106 C138~141 224	175-1011-00	Ceramic chip capacitor 100pF CH	7	C213	182-4763-12	Electrolytic capacitor 6.3V47 μ F	1
220,223,225 C301,310,315 506~508	176-1021-00	Ceramic chip capacitor 1000pF CH	10	C109	182-4763-32	Electrolytic capacitor 16V47 μ F	1
C135,137	176-1801-00	Ceramic chip capacitor 100pF CH	2	C120	182-4763-42	Electrolytic capacitor 25V47 μ F	1
C226	176-2201-04	Ceramic chip capacitor 22pF CH	1	C305,618	183-1043-62	Electrolytic capacitor 50V0.1 μ F	2
C221	176-2701-00	Ceramic chip capacitor 27pF CH	1	124,317,318 C327,403,404 405,408,415 416,805,908	183-1053-62	Electrolytic capacitor 50V1 μ F	12
C240	176-3311-00	Ceramic chip capacitor 330pF CH	1	150,302,306 408,409,412 413,414,419 C423,525,603 804,811,813 902,904,910	183-1063-32	Electrolytic capacitor 16V10 μ F	18
C202	176-4711-00	Ceramic chip capacitor 470pF CH	1	C103,308,313	183-2263-32	Electrolytic capacitor 16V22 μ F	3

REF.NO.	PART NO.	DESCRIPTION	Q'TY
C905	183-3363-42	Electrolytic capacitor 25V33 μ F	1
C113,119	183-4743-62	Electrolytic capacitor 50V0.47 μ F	2
C307	183-4753-52	Electrolytic capacitor 35V4.7 μ F	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
C323,324,325	183-4763-12	Electrolytic capacitor 6.3V47 μ F	3
C121,126,133 143,152,314	183-4763-32	Electrolytic capacitor 16V47 μ F	6
C410,411	183-8843-62	Electrolytic capacitor 50V0.68 μ F	2

③PRE AMP P.W.B (Tape mechanism section)

REF.NO.	PART NO.	DESCRIPTION	Q'TY
IC2	051-0620-00	IC LA2000C	1
IC1	051-0714-01	IC TA7705F	1
Q1	125-2003-02 (102-3402-00)	Transistor RN1202 Transistor (2SC3402)	1
C15	172-3331-10	Polyester capacitor 0.033 μ F	1
C6,9	173-1231-10	Polyester capacitor 0.012 μ F	2
C12	173-4721-10	Polyester capacitor 4700pF	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
IC1~4	173-5611-10	Polyester capacitor 560pF	4
C14	183-1053-62	Electrolytic capacitor 50V1 μ F	1
C7	183-1063-32	Electrolytic capacitor 16V10 μ F	1
C13	183-4743-62	Electrolytic capacitor 50V0.47 μ F	1
C10,11	183-4753-52	Electrolytic capacitor 35V4.7 μ F	2
C5,8	183-4763-12	Electrolytic capacitor 6.3V47 μ F	2
C18	183-4763-32	Electrolytic capacitor 16V47 μ F	1

③BOTTOM P.W.B (Tape mechanism section)

REF.NO.	PART NO.	DESCRIPTION	Q'TY
SW4	013-3937-00	Switch	1
SW1,2	013-3863-00	Switch	2

REF.NO.	PART NO.	DESCRIPTION	Q'TY
SW3	013-3863-01	Switch	1
IC3,4	051-1114-00	IC NJL5161K-P	2

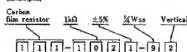
● How to read resistor

Resistors are deleted from the table of electric components, except special resistors.
They can be converted to product Nos. as follows.

Film resistor (Carbon film resistor/Metal film resistor)

Classification	Resistance*	Tolerance of the value of resistance	Rated power	Shape
	0	$\pm 5\%$	0	0
	Example 1	$\pm 5\%$	1/4W	1 Horizontal
	330 Ω =330	2	2 1/2W	2 Vertical
111 (Carbon film resistor)	33k Ω =333	3	4	3
	4	4	1/2W	4
	7	7	1/4W	7
	8	8	1/2W	8
	9	9	1/2W	9
114 (Metal film resistor)	0	1	1W	0
	1	$\pm 5\%$	2 2W	1 Horizontal
	2	3	3W	2

(Example)

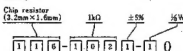


Note 1. The first two of three digits representing resistance are effective digits and the last one represents number of "0" following this.
Unit is given in ohm (Ω).

Chip resistor

Classification	Resistance*	Tolerance of the value of resistance	Rated power
	0 for 0 Ω resistor	0 for 0 Ω resistor	0 for 0 Ω resistor
Example	1	$\pm 5\%$	1/4W
116	330 Ω =330	1	1.6 2.5mm
	33k Ω =333	2	2
	0 for 0 Ω resistor	0 for 0 Ω resistor	0 for 0 Ω resistor
117	1	$\pm 5\%$	1/4W
	2	$\pm 10\%$	2
	0	0	0
118	1	$\pm 5\%$	1/4W
	2	$\pm 10\%$	2
	0 for 0 Ω resistor	0 for 0 Ω resistor	0 for 0 Ω resistor
119	1	$\pm 5\%$	1/4W
	2	$\pm 10\%$	2

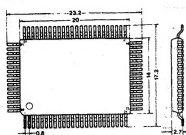
(Example)



■ PD7516GF-436-3B9 051-1541-10 Master Micro Computer

※051-1541-10 is a performance improved device of 051-1541-02.

1. Outward Form



II. Description

No.	Symbol	WG	Function
1	NC	—	Connect to GND.
2	VDD	—	Connect to the VDD terminal (5V±10%).
3	REM-1	O	Tuner, controller, and amplifier power control.
4	REM-2	O	Connect to the ACC detection port of the slave controller. Power control around the controller.
5	LOUD	O	LOUD control port.
6	CK OUT	O	CK output control port. "L" when traffic information interrupts. Normally "H".
7	T/R	I	When mechanical mechanism is used: TAPE=L, RADIO=L. When not used: GND.
8	FWD/REV	I	When mechanical mechanism is used: FWD=L, REV=H. When not used: GND.
9	MECH/SFX	I	Mechanical mechanism=L, SF-X=H.
10	LCD-BUSY	I	Connect to the BUSY terminal of the LCD driver μPD7225.
11	LCD-RESET	O	Connect to the RESET terminal of the LCD driver μPD7225.
12	LCD-C/D	O	Connect to the C/D terminal of the LCD driver μPD7225.
13	LCD-CS	O	Connect to the CS terminal of the LCD driver μPD7225.
14	REMA	O	FLAP power control. "H" during FLAP operation.
15	DI	I	Connect to the DI terminal of the 93C46.
16	LCD-DQ	O	Connect to the SI terminal of the LCD driver μPD7225.
17	LCD-SCR	O	Connect to the SCR terminal of the LCD driver μPD7225.
18	NC	O	Specifies PPD and outputs LO.
19	K17	O	Key input terminal.
20	K10	O	Key input terminal.
21	K03	O	Key output terminal.
22	K00	O	Key output terminal.
23	GND	—	GND terminal.
24	VOL-CS	O	Electronic VR. Connect to the CE terminal of the LC7537.
25	VOL-DO	O	Connect to the DI terminal of the electronic VR. LC7537 and to the DI terminal of the EE-PROM 93C46.
26	VOL-CLK	O	Connect to the CLK terminal of the electronic VR. LC7537 and to the SC terminal of the EE-PROM 93C46.
27	CS	O	Connect to the CS terminal of the EE-PROM 93C46.
28	LED	O	LED flashing control terminal.
29	CH1 LED	O	Connect to the driver input terminal of the TD82706. (LED illuminated when the channel IN is at "H").
30	CH2 LED	O	Connect to the driver input terminal of the TD82706. (LED illuminated when the channel IN is at "H").
31	BEEP	O	4.09MHz output in the 3-minute mode. (Normally "L").
32	NC	I	Connect to GND.

No.	Symbol	IO	Function
33	BACK-UP	I	"H" at back-up time. (Detection port to stop the microcomputer when the back-up power is shut off momentarily.)
34	SRQ	I	SRQ of CBUS.
35	SI	I	SI of CBUS.
36	SO	O	SO of CBUS.
37	SCKO	O	SCK of CBUS.
38	ACC IN	I	ACC ON/OFF detection. ("H" when ACC is ON, "L" when ACC is OFF).
39	GND	—	Connect to the GND terminal.
40	NC	I	Connect to GND.
41	NC	I	Open.
42	IC	I	Connect to GND.
43	X1	—	Connect to the 4.19MHz ceramic oscillator.
44	X2	—	Connect to the 4.19MHz ceramic oscillator.
45	RESET	I	Microcomputer reset terminal.
46	FF-REW	I	When mechanical mechanism is used: FF, REW=L, "PLAY"=H.
47	FLAP-C-SW	I	Connect to the FLAP open limit switch.
48	FLAP-C-SW	I	Connect to the FLAP close limit switch.
49	FXCK-DET	I	Cassette pack detection. "L" for detected, "H" for not detected.
50	FLAP-O	O	Connect to IN1 of the motor driver TA7291. (Open direction "H". (Brake when both pins 55 and 56 are at "H").
51	FLAP-C	O	Connect to IN2 of the motor driver TA7291. (Close direction "H". (Brake when both pins 55 and 56 are at "H").
52	METAL	O	METAL ON/OFF output port.
53	APC	O	APC "L"/"H" output port. (When mechanical mechanism is used).
54	MUTE	O	Mute output port.
55	CD/R, T	O	Source select output. CD=L, Radio/Tape=H.
56	RTAPE	O	Source select output. Radio=L, Tape=H.
57	DOLBY	O	Dolby "L"/"H" port.
58	AVSS	O	Connect to GND.
59	APC-DET	I	"L" in the intervals of music, "H" when music is going on.
60	RDS-SEL	I	"L" when there is RDS.
61	NC	I	Connect to GND.

III. Key Matrix Table

§1. When SF-X mechanism

(All momentary SW.)

In	Qx4	K00 (22pin)	K01 (21pin)	K02 (20pin)	K03 (19pin)
K01 (27pin)	SEEK-UP APC/FF TRACK-UP	MANU-UP FF IF	For Remo-con EXPANDED SCAN SCK-SEL		
K02 (26pin)	SEEK-DN APC/REW TRACK-DN	MANU-DN REW IF	EXPANDED	SEL	
K03 (25pin)	MT/BLS	MS	MS/ R, M	MASAM	
K04 (24pin)	MT/REP	M2/SCAN	M3/DOLBY	BAND PLAY/PROG DNC-SEL	
K05 (23pin)	TP	RDS	DX	EJECT	
K06 (22pin)	AUD +	AUD -	AUDIO - MODE	FLAP	
K07 (21pin)	VOL +	VOL -	LOUD	POWER ON/OFF	

§2. When mechanical mechanism

(All momentary SW.)

In	Qx4	K00 (22pin)	K01 (21pin)	K02 (20pin)	K03 (19pin)
K01 (27pin)	SEEK-UP	MANU-UP	For Remo-con EXPANDED		
K02 (26pin)	SEEK-DN	MANU-DN	EXPANDED		
K03 (25pin)	M4	M5	MS/ R, M	MASAM	
K04 (24pin)	M2/ APC	M3/ MT	M3/ DOLBY	BAND	
K05 (23pin)	TP/VR	RDS	DX		
K06 (22pin)	AUD +	AUD -	AUDIO - MODE		
K07 (21pin)	VOL +	VOL -	LOUD	POWER ON/OFF	

NOTE: Some of the sets equipped with this microcomputer are not provided with all the above keys.

■ PARTS LIST:

◎Electrical section

◎ELECTRICAL P.W.B

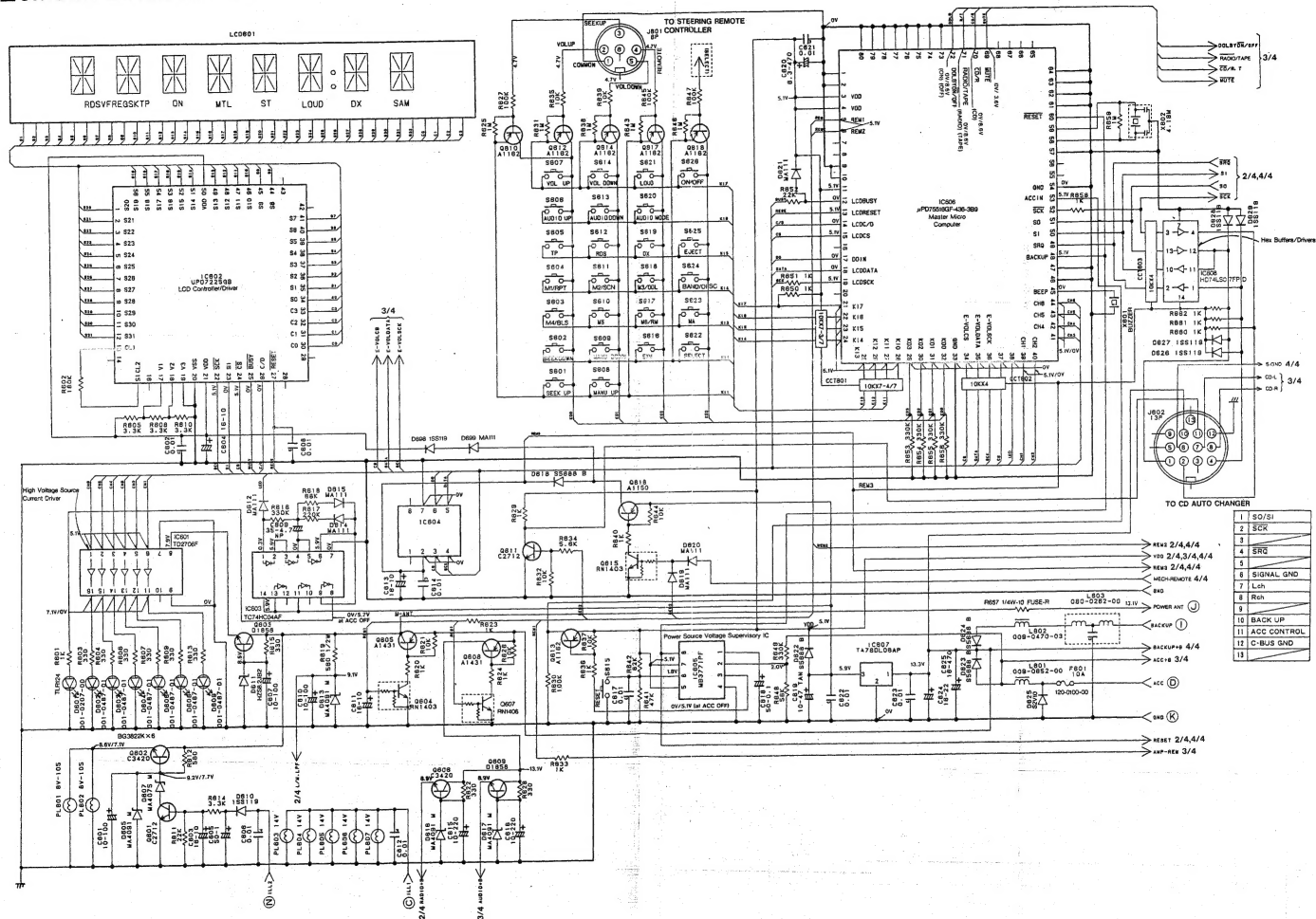
Note: Several different parts listed in the column are alternative parts. One of those parts is used in the set.

REF.NO.	PART NO.	DESCRIPTION	QTY	REF.NO.	PART NO.	DESCRIPTION	QTY
D601	001-0207-00	LED TL124	1	PL601,602	017-0376-02	Pilot lamp	2
D602,603,604,605,606,608,609	001-0487-01	LED BG3822K	6	IC602	051-1151-10	IC μPD7225GB	1
S601-628	013-3943-00	Switch	26	C602,608	178-1032-05	Ceramic chip capacitor 0.01μF	2
PL603-607	017-0345-09	Pilot lamp	5	LC601	379-0364-07	Indicator	1

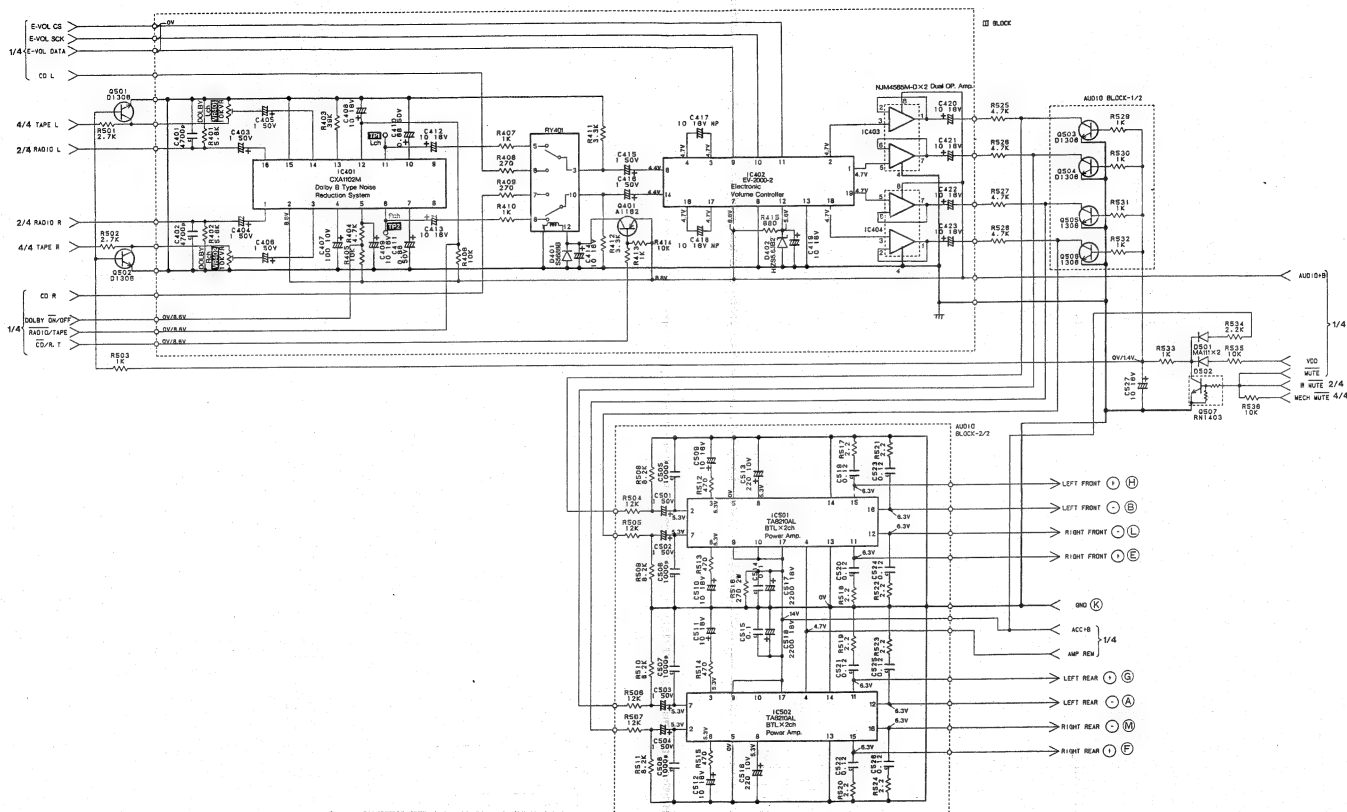
◎MAIN P.W.B

REF. NO.	PART NO.	DESCRIPTION	QTY	REF. NO.	PART NO.	DESCRIPTION	QTY
D610,626,627,628,629,636	001-0330-00	Diode 1SS119	6	L106,203	010-2199-16	Coil 2.2μH	2
D625	001-0334-00	Diode DSA176	1	L104	010-2199-35	Coil 82μH	1
D105	001-0356-05	Diode (SZV10)	1	L201	010-2199-40	Coil 220μH	1
D201	001-0367-00	Diode 1SS181	1	L105	010-2230-29	Coil 39μH	1
D402	001-0377-32	Diode MA4A058M	1	VR101	012-3808-05	Variable resistor 4.7kΩ	1
D607	001-0377-41	Diode MA4A075M	1	VR102	012-3808-11	Variable resistor 220kΩ	1
D611	001-0377-44	Diode MA4A082M	1	VR201,203	012-4863-07	Variable resistor 22kΩ	2
D605,613,616,617	001-0377-47	Diode MA4A091M	4	VR301	012-4863-09	Variable resistor 47kΩ	1
D101	001-0377-57	Diode MA4120H	1	S101	012-3894-00	Switch	1
	001-0378-59	Diode (MTZJ13A)	1	RY401	014-0510-02	Relay	1
	001-0400-57	Diode (HZS12JB3)	1	CCT602,603	050-0077-02	Component circuit 10kΩx4	2
	001-0468-00	Diode S56888	7	CCT601	050-0089-03	Component circuit 10kΩx7	1
	001-0516-00	Diode MA111	10	CCT901	050-0090-02	Component circuit 10kΩx10	1
	001-0599-00	Diode 1SV154	2	CCT101	050-0101-01	Component circuit 10kΩx11	1
IF201	005-1022-51	IF-transformer	1	IC608	051-0160-58	IC HD74L907FPD	1
L204	005-1029-00	IF-transformer	1	IC101	051-0287-05	IC TC4068BF	1
L602	009-0470-03	Choke	1	IC304	051-0555-01	IC NJM2058M	1
L601	009-0852-00	Choke	1	IC303	051-0620-00	IC NJM200C	1
L102,103	010-1892-07	Coil 100μH	2	IC603	051-0899-05	IC TC74HC04AF	1
L101	010-2003-04	Coil 30μH	1	IC605	051-0869-05	IC MB3771PF-G	1
L107	010-2174-35	Coil 820μH	1	IC601	051-0942-05	IC TD82706B(CLAR)	1
L102,104	010-2174-36	Coil 1mH	1	IC401	051-1038-01	IC CXA1102M	1
				IC501,502	051-1111-20	IC TA8210AL	2
				IC301	051-1144-10	IC LA2231M-B	1
				IC302	051-1150-20	IC LC7073M	1
				IC607	051-1188-01	IC TA78DL06AP	1

■CIRCUIT DIAGRAM: 1/4

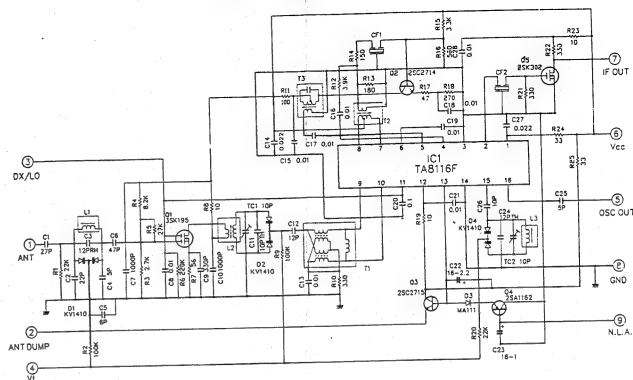
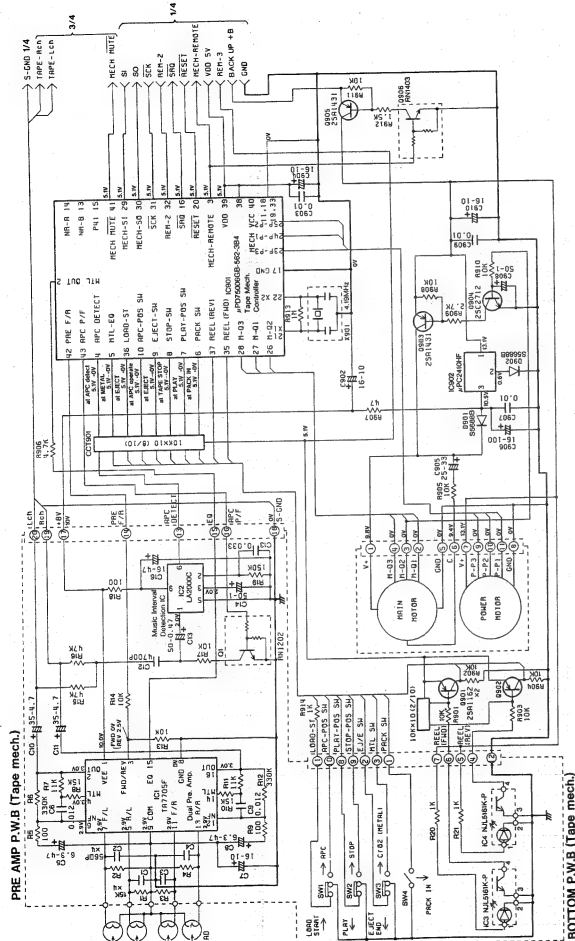


■CIRCUIT DIAGRAM: 3/4

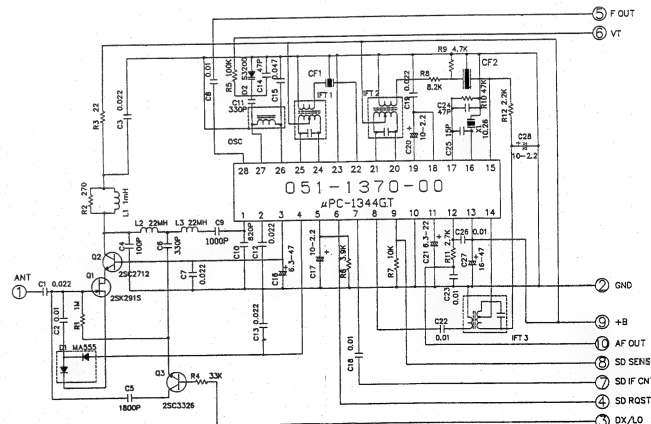


■CIRCUIT DIAGRAM: 4/4

■BLOCK CIRCUIT DIAGRAM: ©UKW TUNER BLOCK Ass'y 880-1418A

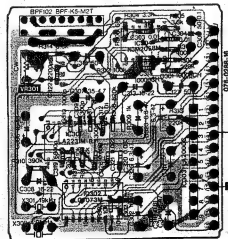
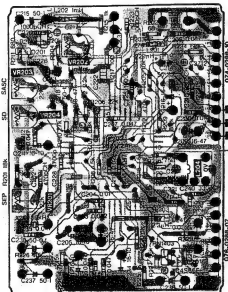
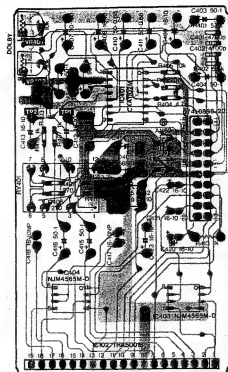
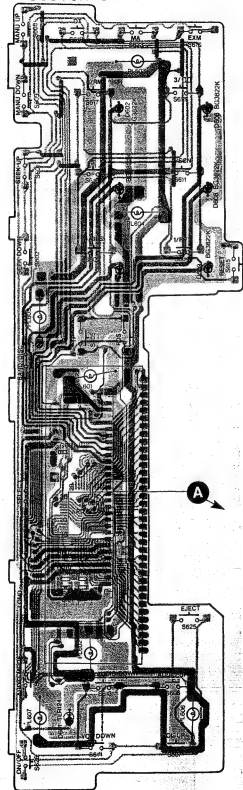


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■ PRINTED WIRING BOARD:

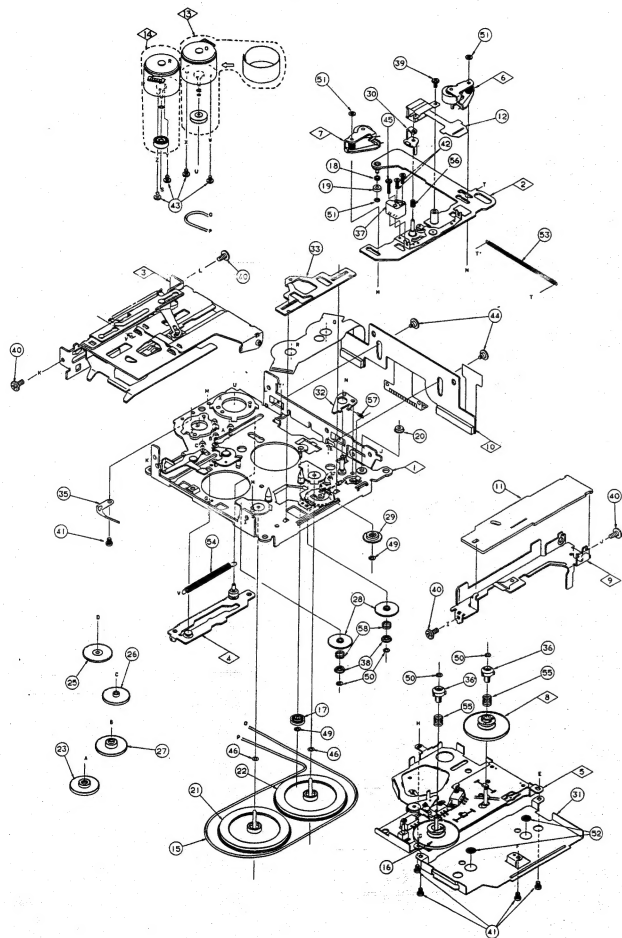
ESCUTCHEON P.W.B



1	50/51	8	Rch
2	SCR	9	
3		10	BACK UP
4	SRQ	11	ACC CONTROL
5		12	C-BUS GND
6	SIGNAL GND	13	
7	Lch		

■EXPLODED VIEW - PARTS LIST:

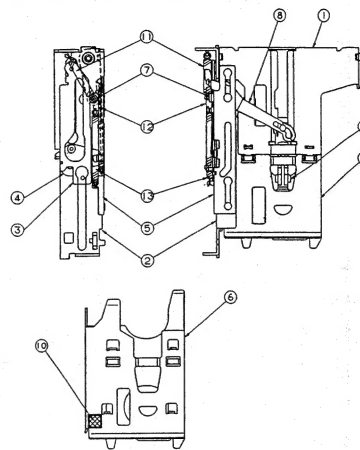
©Tape mechanism section 930-0597-08 (SF-X)



REF.NO.	PART NO.	DESCRIPTION	Q'TY	REF.NO.	PART NO.	DESCRIPTION	Q'TY
1	960-4322-03	Deck plate ass'y	1	29	613-0250-00	Change gear A	1
2	960-4005-10	Head plate ass'y	1	30	630-2342-04	Adjust link	1
3	960-4320-04	Eject sub ass'y	1	31	630-2345-05	Flywheel plate	1
4	960-4011-07	Mode plate ass'y	1	32	630-2374-01	CH-hold plate	1
5	960-4346-01	Bottom sub ass'y	1	33	630-2343-06	Change plate	1
6	960-4050-06	Roller sub ass'y F	1	35	630-2408-01	Motor spring	1
7	960-4051-09	Roller sub ass'y R	1	36	631-2024-00	Slide bush	2
8	960-4338-01	Reel ass'y F	1	37	631-0650-00	Adjust base	1
9	960-4117-01	P.W.B frame ass'y	1	38	631-0637-00	Idler roller	2
10	990-0693-01	P.W.B ass'y	1	39	714-2003-81	Machine screw (M2x3)	1
11	099-9637-00	PRE P.W.B	1	40	716-1470-00	Screw	4
12	011-0316-11	Head	1	41	716-0717-10	Steel screw	5
13	SMA-123-100	Main motor ass'y	1	42	716-0833-02	Azimuth screw	2
14	SMA-122-103	Power motor ass'y	1	43	716-0835-00	Screw	4
15	602-0111-00	Belt	1	44	716-1523-00	P.W.B-G-screw	2
16	960-4337-01	Reel ass'y R	1	45	739-2090-17	Precision screw	1
17	604-0036-05	Tension pulley	1	46	746-0624-00	Washer	2
18	610-0316-01	Head-P-roller-M	1	49	746-0724-00	Washer	2
19	610-0313-02	Driving roller	1	50	746-0857-00	Washer	4
20	610-0347-00	Head-P-G-roller	1	51	746-0768-00	Washer	3
21	611-0084-03	Flywheel R	1	52	746-0767-00	Washer	2
22	611-0085-02	Flywheel F	1	53	750-2715-02	Head-P-spring	1
23	613-0122-01	Shift-P-gear	1	54	750-3018-00	Mode-P-spring	1
25	613-0246-00	Gear A	1	55	750-3033-01	Slide spring	2
26	613-0247-00	Gear B	1	56	750-2721-02	Azimuth spring	1
27	613-0248-00	Gear C	1	57	750-2725-00	CH-hold spring	1
28	613-0306-01	Play idler gear	2	58	750-2793-01	Idler spring	2

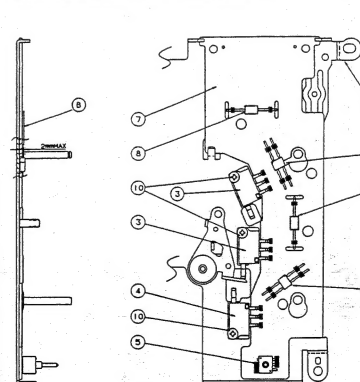
REF. NO.	PART NO.	DESCRIPTION	Q'TY	REF. NO.	PART NO.	DESCRIPTION	Q'TY
1	960-4322-03	Deck plate ass'y	1	29	613-0250-00	Change gear A	1
2	960-4005-10	Head plate ass'y	1	30	630-2342-04	Adjust link	1
3	960-4320-04	Eject sub ass'y	1	31	630-2345-05	Flywheel plate	1
4	960-4011-07	Mode plate ass'y	1	32	630-2374-01	CH-hold plate	1
5	960-4346-01	Bottom sub ass'y	1	33	630-2343-06	Change plate	1
6	960-4050-06	Roller sub ass'y F	1	35	630-2408-01	Motor spring	1
7	960-4051-06	Roller sub ass'y R	1	36	631-2024-00	Slide bush	2
8	960-4336-01	Reel ass'y F	1	37	631-0650-00	Adjust base	1
9	960-4117-01	P.W.B frame ass'y	1	38	631-0637-00	Idler roller	2
10	990-0693-01	P.W.B ass'y	1	39	714-2003-81	Machine screw (M2x3)	1
11	099-9637-00	PRE P.W.B	1	40	716-1470-00	Screw	4
12	011-0316-11	Head	1	41	716-0717-10	Steel screw	5
13	SMA-123-100	Main motor ass'y	1	42	716-0833-02	Azimuth screw	2
14	SMA-122-103	Power motor ass'y	1	43	716-0835-00	Screw	4
15	602-0111-00	Belt	1	44	716-1523-00	P.W.B-G-screw	2
16	960-4337-01	Reel ass'y R	1	45	739-2090-17	Precision screw	1
17	604-0036-05	Tension pulley	1	46	746-0624-00	Washer	2
18	610-0316-01	Head-P-roller-M	1	49	746-0724-00	Washer	2
19	610-0313-02	Driving roller	1	50	746-0857-00	Washer	4
20	610-0347-00	Head-P-G-roller	1	51	746-0768-00	Washer	3
21	611-0084-03	Flywheel R	1	52	746-0767-00	Washer	2
22	611-0085-02	Flywheel F	1	53	750-2715-02	Head-P-spring	1
23	613-0122-01	Shift-P-gear	1	54	750-3018-00	Mode-P-spring	1
25	613-0246-00	Gear A	1	55	750-3033-01	Slide spring	2
26	613-0247-00	Gear B	1	56	750-2721-02	Azimuth spring	1
27	613-0248-00	Gear C	1	57	750-2725-00	CH-hold spring	1
28	613-0308-01	Play idler gear	2	58	750-2793-01	Idler spring	2

©EJECT SUB ASS'Y 960-4320-04



REF. NO.	PART NO.	DESCRIPTION	Q'TY
1	960-4007-05	Guide arm ass'y	1
2	960-4008-05	Side frame ass'y	1
3	960-4009-06	Eject-P-ass'y	1
4	960-4010-05	Eject link ass'y	1
5	960-4057-05	Loading-P-ass'y	1
6	606-0090-10	Pack guide	1
7	610-0314-03	Guide-A-roller	1
8	630-2340-01	Swing arm	1
9	631-0599-04	Pack stopper	1
10	746-0816-01	Pack set washer	1
11	750-2716-01	Swing A spring	1
12	750-2719-01	Guide arm spring	1
13	750-2791-01	Load-P-spring	1

©BOTTOM SUB ASS'Y 960-4346-01



REF. NO.	PART NO.	DESCRIPTION	Q'TY
1	960-4096-04	Bottom-P-ass'y	1
3	013-3863-00	Switch	2
4	013-3863-01	Switch	1
5	013-3937-00	Switch	1
6	051-1114-00	IC (NJL5161K-P)	2
7	099-9394-01	Bottom P.W.B	1
8	111-1021-91	Film resistor (1KΩ)	2
10	716-0834-00	Screw	3

■ADJUSTMENT OF MECHANISM:

1. Adjustment of tape speed

Reproducing the 3kHz speed tape, adjust VR inside the motor so that the reading of frequency counter becomes within the range of 2990Hz to 3100Hz. (Refer to Fig. 1)

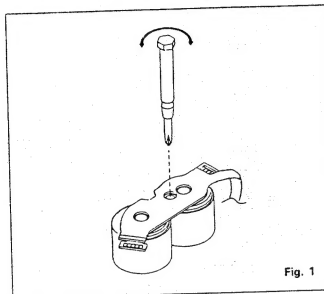


Fig. 1

2. Adjustment of head azimuth

- (1) Play back azimuth tape (10kHz, -10dB) and adjust the screw so that the peak of FWD and REV will be 10kHz. (Refer to Fig. 2)
- As shown in the figure, ② turn in the direction ① tilts the head upward and a turn in the direction ③ tilts it downward.
- (2) After completion of adjustment, apply LOCK-TIGHT Bond to the ③ section. (Refer to Fig. 2)

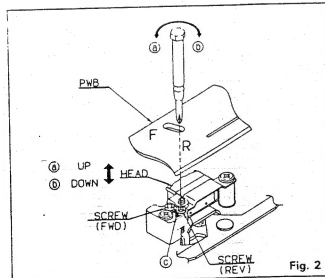


Fig. 2

■REPLACEMENT OF MECHANISM PARTS:

1. Replacement of belt, flywheel and reel base ass'y

- (1) Remove Screws ④ (4 pcs.). (Refer to Fig. 3)
- (2) Remove the flywheel-P-ass'y and then the bottom sub ass'y.

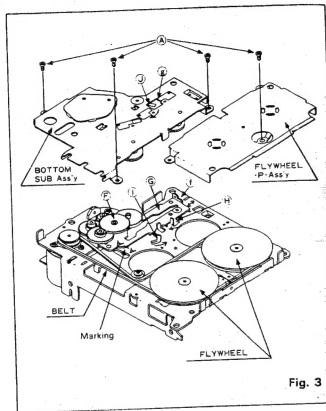


Fig. 3

- (3) Replace the belt with a new one.
*Pay attention so that oils such as MR paste do not stick to the belt.
- Replace the flywheel with a new one. (Refer to Fig. 4).
- *When replacing the flywheel, apply FLOIL947P to Section ③.
- Note: Use specified oils.

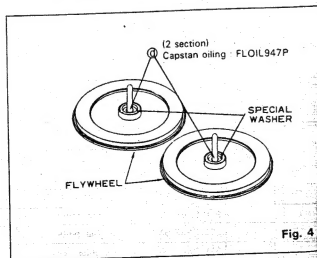


Fig. 4

- (4) Replacement of reel base ass'y
(Refer to Fig. 5)
- (a) Remove the special washer ① ($\phi 3.2$ split).
- (b) Remove the slide bushing ② and slide spring ③.
- (c) Replace the reel base ass'y with a new one.
*When replacing the reel base ass'y, apply FLOIL G-488 to the section ④ of the reel shaft. Also check F and R sides of the reel base ass'y. The F side of the reel base ass'y is identified with blue, and the R side with white.
- (d) Reassemble the reel base ass'y in the reverse order of (a) and (b).

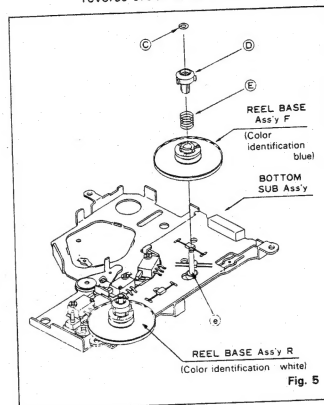


Fig. 5

- (5) Following replacement of the belt, flywheel and reel base ass'y, remove the gear C ⑥ and move Section ① of the mode plate ass'y ⑤ in the arrowed direction to make marks A-A fit. (Refer to Fig. 3).
- *Moving the mode plate ass'y ⑤ without removing the gear C ⑥ causes chipping of gears.
- (6) Hold ⑥ again.
- (7) Move links of ⑧ and ① to the arrowed direction.
- (8) Push the link ④ of the bottom sub ass'y toward the arrowed direction through the hole ② so that the reel base ass'y is placed below the flywheel. Holding this condition, drop the bottom sub ass'y.
- (9) Reassemble the flywheel-P-ass'y and fasten it with Screws ④ (4 pcs.).

2. Replacement of head

- (1) Remove solder from 5 points at Section ①. (Refer to Fig. 6).
- (2) Loosen Screws ⑧ (2 pcs.) to remove the frame sub ass'y.

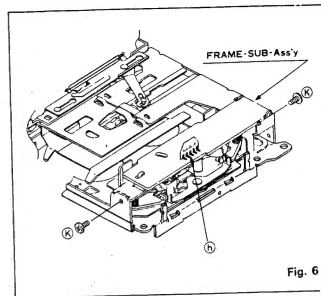


Fig. 6

- (3) Remove the screw ① and then adjust base ②. (Refer to Fig. 7)
- (4) Remove the screw ③, lift adjust-link ④ and replace the head.
- (5) Reassemble the frame sub ass'y in the reverse procedures of (1) to (4).
- (6) Perform the azimuth adjustment of the head.

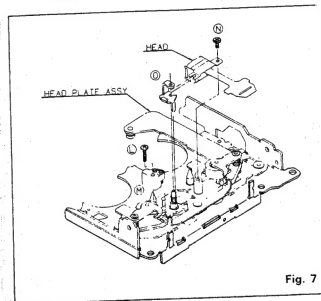
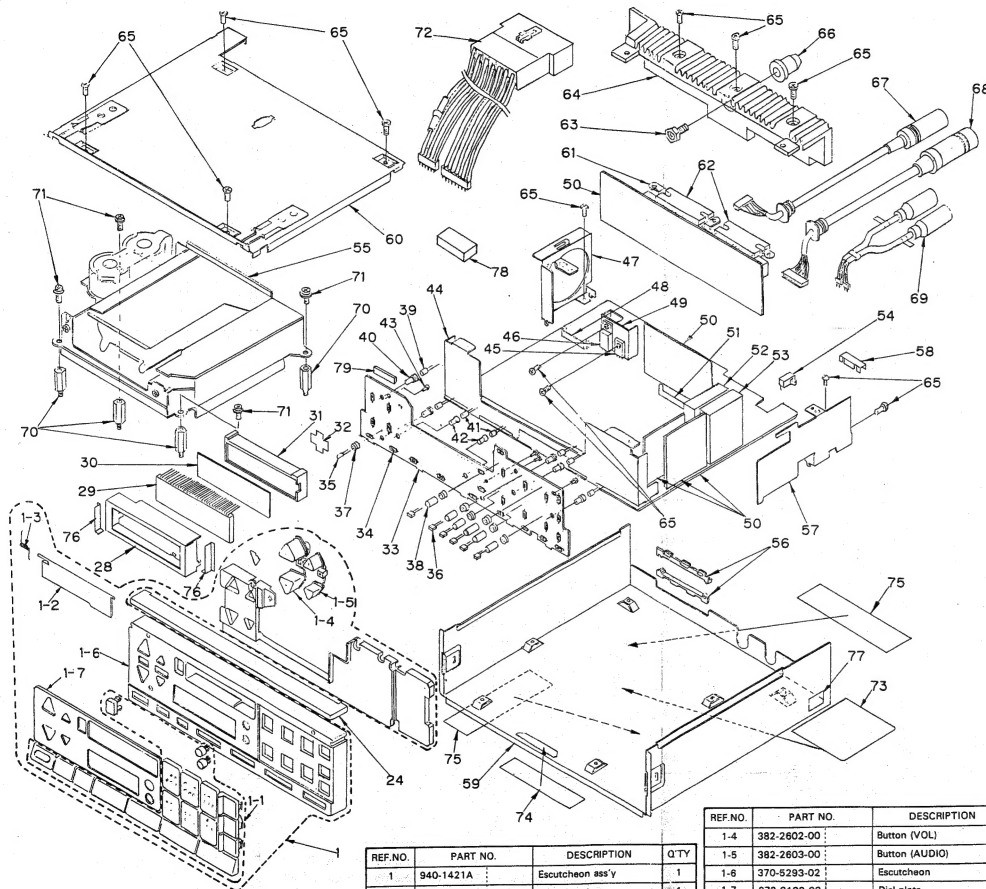


Fig. 7

■EXPLODED VIEW • PARTS LIST:

©Main section



REF.NO.	PART NO.	DESCRIPTION	QTY
1	940-1421A	Escutcheon ass'y	1
1-1	947-0295-01	Button ass'y	1
1-2	320-0391-25	Dustproof cover	1
1-3	750-2309-01	Spring	1

REF.NO.	PART NO.	DESCRIPTION	QTY
1-4	382-2602-00	Button (VOL)	1
1-5	382-2603-00	Button (AUDIO)	1
1-6	370-5293-02	Escutcheon	1
1-7	372-3182-03	Dial plate	1
24	335-3682-00	Holes cover	1
28	330-9654-00	LCD holder	1

REF.NO.	PART NO.	DESCRIPTION	QTY
29	379-0364-07	Indicator	1
30	335-3788-02	Color filter	1
31	335-3683-00	Back light	1
32	347-3492-00	Illumi. paper	1
33	099-9460-01	Escutcheon P.W.B	1
34	013-3943-00	Switch	26
35	001-0207-00	LED (RED/D601)	1
36	001-0487-01	LED (GREEN/D602-604, 605, 606, 609)	6
37	340-1528-00	Spacer (D601-604, 606, 608, 609)	7
38	345-7252-00	Shade (D603-604, 606, 608, 609)	6
39	017-0345-08	Pilot lamp (PL603-607)	5
40	345-3814-38	Lamp rubber (PL602-607)	5
41	017-0376-02	Pilot lamp (PL601, 602)	2
42	345-7148-00	Lamp cap (PL601, 602)	2
43	716-0778-00	Wave screw	4
44	309-0613-01	Front plate	1
45	102-3420-00	Transistor (2SC3420)	1
46	051-1188-01	IC (TA78DL06AP)	1
47	330-9860-00	Fan holder	1
48	076-0412-11	Plug	1
49	330-9895-00	TR holder	1
50	099-9923-01	Main P.W.B	1
51	076-0412-20	Plug	1
52	880-1601H	LW/MW Tuner block ass'y	1
53	880-1418A	UKW Tuner block ass'y	1
54	013-3894-00	Switch	1
55	930-0597-08	Tape mechanism (SF-X)	1
56	335-3685-00	Lead clamp	2
57	330-9659-00	Antenna holder	1
58	347-3498-00	Insulator	1
59	311-1502-01	Lower case	1
60	303-0400-00	Upper cover	1
61	331-0091-00	IC holder	1
62	051-1111-20	IC (TA8210AL)	2
63	710-5014-31	Hex. bolt	1
64	313-1533-00	Heat sink	1
65	714-2606-81	Machine screw (M2.6x8)	12
66	345-3653-01	Spacer	1
67	854-2454-01	Extension lead (6PIN)	1
68	854-2455-00	Extension lead (13PIN)	1
69	092-0648-00	Antenna receptacle	1
70	716-0875-00	Spacer	4
71	716-0878-00	IT-screw	4
72	854-2432-01	Extension lead	1
73	286-7687-00	Set plate	1
74	347-2385-00	Shade	1
75	347-3503-00	Label	2
76	347-3501-00	Shade	2
77	347-2004-00	Shade	1
78	347-3506-00	Shade	1
79	345-4032-00	Spacer	1